

CLAIMS

1. A method for gait rehabilitation, comprising:
- 5 identifying at least one deficient gait element;
exercising said deficient gait element individually using a rehabilitation apparatus; and
exercising said deficient gait element in concert with at least one other gait element using said rehabilitation apparatus.
- 10 2. A method of claim 1, wherein gait elements are chosen from a group consisting of feet, legs, hips, torso, shoulders, head, hands and arms.
3. A method of claim 1, further comprising exercising a complex gait.
- 15 4. A method of claim 3, wherein a complex gait is chosen from the group consisting of balance, overcoming obstacles, moving backwards, movement on steps, turning, movement on slopes and varying speed.
- 20 5. A method of claim 1, wherein said gait rehabilitation is performed sitting down.
6. A method of claim 5, wherein said gait rehabilitation is performed in a wheelchair.
7. A method of claim 1, wherein said gait rehabilitation is performed utilizing an object
- 25 designed to assist with movement.
8. A method of claim 7, wherein said object is selected from a group consisting of a walker, crutches, ski poles, a walking stick or a cane.
- 30 9. A method for gait rehabilitation, comprising:
detecting the positions of at least one gait element during movement;
recording the detected positions of the at least one gait element, wherein position recordings are made;
displaying said position recordings of the at least one gait element; and

exercising at least one gait element based on said display of said recording.

10. A method of claim 9, wherein a gait element is chosen from a group consisting of feet, legs, hips, torso, shoulders, head, hands and arms.

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11. A method of claim 9, wherein at least one position sensor is used for said detecting.

12. A method of claim 9, wherein at least one optical sensing device is used for said detecting.

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13. A method of claim 9, wherein at least one position sensor and at least one optical sensing device is used for said detecting.

14. A method of claim 9, wherein said position recordings are of movements performed by a person undergoing rehabilitation.

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15. A method of claim 9, wherein said position recordings are of movements performed by a person not undergoing rehabilitation.

16. A method according to any of claims 9-15, wherein said exercising is analyzed in comparison to said position recordings.

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17. A method of claim 16, wherein additional exercise is performed based on said analysis.

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18. Apparatus for rehabilitation comprising:

a motorized pedal adapted to be moved in a plane perpendicular to a surface; and
a track adapted to support said pedal and a weight of a patient of at least 40 Kg when said pedal moves at a line near and parallel to said surface.

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19. Apparatus for rehabilitation, comprising:

a first motor, wherein said first motor provides movement to components of the apparatus on an x-axis generally parallel to a surface;

a second motor, wherein said second motor provides movements to components of the apparatus on a z-axis generally perpendicular to a surface; and

at least one foot pedal component, wherein said foot pedal is operationally connected to said first and second motors and wherein said foot pedal rotates in a plurality of axes.

20. Apparatus according to claim 19, comprising a track for supporting a weight of a patient when said pedal travels along said x-axis with said z-axis being at a minimum value.

21. Apparatus according to claim 19, comprising a foot rest;

wherein when a weight of a patient is placed on said foot rest, said first and second motors vary the amount of movement force provided to said foot pedal component.

22. An apparatus of claim 21, wherein said apparatus is adapted to be used in water.

23. An apparatus of claim 21, wherein said apparatus is portable.

24. An apparatus of claim 21, wherein said foot pedal is equipped with pressure sensors in order to gauge and analyze the patient's force applied on at least one location by a foot of the patient.

25. An apparatus of claim 21, wherein said foot pedal has the capability to extend and retract along a y-axis perpendicular to said axes.

26. An apparatus of claim 25, wherein turning is exercised by utilizing at least the rotational and extension capabilities of said foot pedal while the patient follows a hypothetical curved path.

27. An apparatus of claim 21, wherein said foot rest is a treadmill.

28. An apparatus of claim 21, wherein said foot rest is a second motorized foot pedal.

29. An apparatus of claim 28, wherein said apparatus varies the power to each of said pedals according to a placement of weight of said patient.
30. An apparatus of claim 21, wherein said apparatus further comprises extending
5 support legs for apparatus stability enhancement.
31. An apparatus of claim 21, wherein said foot pedal can be attached to the apparatus at either side.
- 10 32. An apparatus of claim 21, wherein the travel of said foot pedal in the z axis is 20-50 centimeters.
33. An apparatus of claim 21, wherein said foot pedal is connected to the apparatus at the bottom of said foot pedal.
- 15 34. An apparatus of claim 21, wherein said foot pedal is adapted to receive a prosthetic foot.
35. An apparatus of claim 28, where said second foot pedal is adapted to receive a
20 prosthetic foot.
36. An apparatus of claim 21, wherein said motors vary movement to at least some components of said apparatus based on patient use of a walking aid.
- 25 37. An apparatus of claim 36, wherein said walking aid is selected from a group consisting of a cane, crutches, ski poles, a walking stick or a walker.
38. An apparatus of claim 21, wherein said patient exercises with said apparatus while in a seated position.
- 30 39. Apparatus for gait training, comprising:
at least one element adapted to move a foot of a patient;
at least one armpit support; and

at least one motor adapted to move said armpit support such that a patient supported by said support is moved from a sitting posture to a standing posture.

40. Apparatus for gait training, comprising:

- 5 at least one element adapted to move a foot of a patient;
 at least one chair having a seating surface; and
 at least one motor adapted to tilt said seating surface.

41. Apparatus according to claim 40, wherein said seat lifts while tilting.

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42. An apparatus of claim 40, wherein said chair rotates around a vertical axis.

43. An apparatus of claim 41, comprising a backrest and wherein when said chair is moved by said motor, the relationship between said seat and said backrest varies.

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44. An apparatus of claim 43, wherein said chair is provided with at least one torso support.

45. An apparatus of claim 43, wherein said backrest is articulated.

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46. A method of gait rehabilitation, comprising:

- attaching a pedal to a foot of a patient; and
 automatically controlling the rotating said pedal to rehabilitate said patient.

25 47. A method according to claim 46, wherein said rotating is in at least two axes.

48. A method according to claim 46, comprising automatically controlling the translation said foot during said rotating.

30 49. A method according to claim 46, wherein controlling the rotating comprises restricting the rotation range.

50. A method according to claim 46, wherein controlling the rotating comprises restricting the rotation angle.

51. A method according to claim 46, wherein controlling the rotating comprises applying a resistive force to rotation.
- 5 52. A method according to claim 46, wherein controlling the rotating comprises causing said rotation.
53. A method according to claim 46, wherein controlling the rotating comprises initiating said rotation and allowing the rotation to continue to completion of a desired
10 amount.
54. A method according to claim 46, comprising rehabilitating two feet concurrently.
- 15 55. A method according to any of claims 46-54, wherein said pedal is movable in a plane perpendicular to a surface and wherein said automatically controlling the rotation is responsive to movement of said pedal in said plane.